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DIRECTIONS
FOR THE
COLLECTION OF
Coleoptera,
FOR THE USE OF BEGINNERS.



SPRINGFIELD, MASS.

MAY, 1872.

5

PREFACE.

Having often felt the need of a few printed directions, inexpensive and simple, that I could pass to my young friends who were beginning the collection of Coleoptera, I print the few following pages. They cannot be expected to present much that is new to the experienced collector and are probably open to a great deal of criticism. Nothing but a mere enumeration of some of the more common methods of collecting can be given in so limited a number of pages, but that they may prove of some slight use, at least in encouraging the study of this branch of Nature's works, is the earnest wish of the writer,

GEORGE DIMMOCK.

SPRINGFIELD, MASS., MAY, 17, 1872.

DIRECTIONS.

In almost every conceivable place where insect life is able to exist, can be found some of the nearly innumerable species of Coleoptera, or beetles. For their collection but little apparatus is needed, and in the following pages will be enumerated some of the most necessary articles and a few of the varied places where specimens may be advantageously collected.

APPARATUS.

First in importance, for the successful collecting of Coleoptera, is a net for beating the bushes, weeds and grass; and for taking them on the wing. Nets are made in different ways and of a great variety of materials, but I propose to give only one method, and that for making a durable, simple and

cheap net. Procure about thirty-nine inches of wire, between No's, 6 and 10 wire-gauge, and bend it into the form represented in Fig. 1, making the diameter of the ring about one foot. Then obtain,

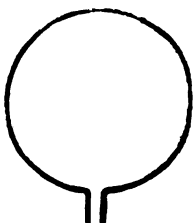


Fig. 1.

from some dealer in fishing tackle, a brass joint, such as is used for fish poles, of about five-eighths of an inch in diameter. Taking the longer portion of this joint, plug up the larger end, so as to fill about half the length of the tube. Care must be taken to have the plug perfectly true, but not tight enough to spring the brass out of shape; and to have it entirely fill up the joint, as far as the middle. Then place the points of the wire, in Fig. 1, having previously flattened or roughened them, into the unoccupied end of the brass joint, and cast lead or pewter about them, so as to fill the remaining half of the tube and leave them in the form shown in Fig. 2. The end in which the

wires are placed, can then be flattened slightly to prevent turning, should the lead become loosened. The plug being then removed, the net-frame will be ready for the net to be sewed on. The other part of the joint can be put on the end of a cane or stick, about three feet in length, usually called a net-stick.

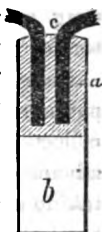


Fig. 2*.

The net should be made of some fine, thin, but strong cloth, (muslin will do, if nothing better can be obtained ;) and it should be about twenty-seven inches long, and the same size around as the wire ring. It can then be folded over, and sewed upon the wire in as firm a manner as possible. The net is then complete. In carrying this, the the net-portion can be folded and slipped up the back under the coat and the stick used as a cane.

For collecting water-coleoptera a net of nearly the form of a half circle, that is with

* The shaded portion *a*, the lead ; *b*, the space occupied by the plug ; *c*, the wires.

one flat side, is very convenient, so as to drag over the weeds and grass at the bottom of ponds and rivers.

Large mouthed bottles and tubes are indispensable, for preserving specimens, and while collecting, almost all kinds of beetles can be advantageously thrown into alcohol, thus taking up but little space. Afterwards they can be pinned at leisure, or kept for exchange with other collectors. Care should be taken to have the alcohol sufficiently strong, when the specimens are to be kept for a long time in it. Whenever it is necessary to preserve specimens from different localities, in the same bottle, and be able to distinguish them, they can be rolled up in thin, tough paper, on which may be written, *with a sharp pencil*, whatever notes are necessary.

A useful little appliance for collecting *Staphylinidae*, and other beetles living in decaying fungus, bark, etc., is a small tin tunnel, fitted to the cork of a bottle or tube of alcohol. This can be held close down to the side of a toad-stool, which can then be quickly picked and held over the tunnel,

en upon a slight jar from the hand, most the beetles will drop into the tunnel and once into the alcohol. With this simple apparatus, I have often taken as many as 7 specimens of *Staphylinidae* from a single d-stool.

Tweezers or forceps, with fine points, will of much use in picking up specimens, and removing them from bottles; for after a little practice, one can pick up beetles much better with a pair of forceps, than with the fingers.

In taking hold of the smaller species, care must be taken not to crush them, and the best way in many cases is to catch a single beetle with the tweezers, in transferring them to a bottle.

In warmer weather, many specimens can be obtained by holding an open umbrella erected under bushes and weeds, and then shaking them briskly. The beetles will drop from it and can be easily gathered up. Many species, both of Coleoptera and Lepidoptera, can be taken in the same way.

A hatchet, for winter collecting under bark, and a trowel, for digging under car-

tion in summer, will be found very convenient. Many other appliances of less importance will suggest themselves, from time to time, to the collector.

PINNING AND PRESERVING.

Although most Coleoptera can be, and are best collected directly into alcohol ; yet a few are sometimes injured by the immersion and are best preserved when pinned immediately upon their capture. Those of a light yellow or red seem to be most affected by alcohol and rare specimens of these colors should be pinned when taken.

Upon the skill and taste with which beetles and other insect specimens are pinned, depends, in a great measure the neatness, beauty and value of the collection. Many collectors, just beginning, pin their specimens in such a slovenly and immethodical manner that they are, in reality, spoiled. Often, after becoming more experienced, they throw away all except the rare specimens of their early collecting.

The pins used for insect specimens are of two kinds, German and English. The lat-

ter are of various lengths and are rarely used, to any extent, in this country. They are made by Edleston and Williams, Crown Court, Cheapside, London. The German pins which are uniformly of one and one-half inches in length are manufactured by Klager of Berlin. These are in common use in this country and are numbered from one to five, one being the smallest.

All Coleoptera should be pinned through the right wing-cover, or elytron, about one third of the distance from the thorax, toward the tip. The pin should pass out between the middle and hind leg of the insect, on the right side ; care being taken not to have it pass through, or push off the legs. The beetle should then be slid upward until its back is three eighths of an inch from the head of the pin. No specimen should ever be so pinned that the head or one side is drooping. If there be any difference the head should be slightly the highest, but not enough so as to be at all noticeable.

Many collectors even take the trouble to spread out the legs, palpi and antennae of their specimens, and although it makes the

collection look much more systematic ; yet for one who collects many hundred specimens every day it seems hardly profitable.

The manner of spreading beetles is to pin them upon a piece of cork or pith, sliding it up close to their bodies, and fastening out their legs and antennae with fine pins or needles. This can best be done after they are killed by immersion in alcohol.

Quite small beetles are usually mounted upon rectangular bits of paper, or isinglass, of about one quarter by three eighths of an inch, or upon triangular pieces of paper, one quarter of an inch in length and one sixteenth wide, in the broadest part. When isinglass is used, it should have a strip of thin paper folded over the end, so as to cover about one fourth of the length. The triangular pieces are considered the best by many collectors, because they permit an unobstructed view of the under side of the head and the mouth-parts of the insect, upon which often depend its identification.

These pieces which are sometimes termed "pallets," should be made from quite stiff

white paper. This is at first cut into strips a quarter of an inch in width and from these, by cross-cuts, can be made the little pallets, which should never be more than one fourth of an inch in length and should have a fine point. The specimens are fastened to the paper by a glue made of white shellac dissolved in alcohol, which mixture can also be used in repairing broken specimens. Other preparations are used for the purpose, but this seems as good as any. Very little is necessary to fasten the specimens, and it should be done neatly.

The forms of cabinet used for the preservation of specimens, after mounting, are various, and each collector has his favorite plan. Most naturalists now use tight boxes, or cases of shallow drawers, although some, whose object is more to display their specimens, pin them in show-cases or glass-covered boxes. This is not proper for a truly scientific collection, and no rare specimen should be allowed to remain in such cases.

For besides the liability to the specimens becoming infested with museum pests, which

can usually find easy ingress into such cases, they are continually fading, and in a few years their beauty and scientific value are destroyed. This is, in a measure, sometimes overcome, by covering the cases with black cloth, so as to exclude most of the light, but even then some are much injured. Those of a light color are especially affected by such exposure to light.

A convenient mode of keeping pinned specimens is to have wooden boxes, of either one and five-eighths, or three and one-half inches, inside depth, shutting closely. If of one and one-half inches in depth, they should have a light cover; but if three and one-half inches, they should be split in the middle and one half furnished with a narrow cleat, extending around the inner side, so that one half of the box acts as cover for the other half; and insects can then be pinned in both halves. These boxes can then be arranged on shelves, like books, and afford easy access to the different classes of specimens. The bottoms of the boxes should be lined with sheet cork, pith, felt or some

other soft material, into which to crowd the pins, without bending them. Sheet cork of the proper size can be obtained of dealers in insect-collecting apparatus. When broom-corn pith can be obtained, it furnishes an excellent material for lining. It should be allowed to remain in the fields, where it was grown until the early spring, and then the winds of winter will have removed the sap from the stalks, and bleached them. It can then be gathered, by cutting the larger pieces between the joints. These will be found to vary, in length, from six to twelve inches. The exterior coat should then be removed and the pith shaved down a little upon one, or both sides, when it can be glued to the bottom of the boxes. If it is wished to have the boxes present a neat appearance, the pith can be made to cover the whole bottom of the box; then it can be smoothed with sand-paper, and a sheet of white paper pasted upon it, with thin flour paste.

Much taste can be displayed in labelling and arranging the specimens in the boxes. A systematic classification should be main-

tained, so that any specimen may be found without delay. A good method is to follow the classification in *Leconte's Catalogue of the Coleoptera of N. A.*, (Smithsonian Institution, 1863,) and *Melsheimer's Catalogue of the Coleoptera of the U. S.*, (Smithsonian Institution, 1853.)

In labelling, a small label should be used. The size represented in Fig. 8, is a very good one, or it might

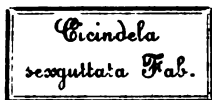


Fig. 8.

be made still smaller. These labels, if ruled or printed in red, give a neat appearance to the collection; but in no cases should the label, or paper which is placed over the cork or pith, at the bottom of the box, be of any gay color; for this detracts much from the general beauty of the collection. A clean white back-ground, with the specimens arranged in regular columns, has a neat and systematic appearance, and though the collection be small, its order reflects much credit upon the collector.

A piece of camphor, kept in the boxes,

tends to drive away museum pests ; but, if once introduced, they should be destroyed, by the free use of pure benzine. It is necessary to look over a collection, at intervals of a week or two, to see if those little depredators are doing any damage to it. If a specimen is infested, it will usually be apparent from the dust and dirt scattered beneath it, by the enclosed insect ; and generally, if the box is given a slight jar, the dark colored refuse will fall, quite copiously, from the infested specimens.

Specimens can be sent by mail in small glass bottles of alcohol enclosed in wooden or tin boxes with cotton or felt about them. They can also be sent in tin boxes, by packing them with cotton, soft paper or cloth and then pouring just enough alcohol over them to saturate them. The boxes should not be made round or cylindrical for the specimens will roll in them if sent any great distance, and thus be broken. A convenient size of box is one inch deep, two inches wide and three inches long. The boxes should always be closely filled so as to pre-

vent jarring and jamming. Of course of alcoholic specimens can be sent in this way as those that had been dried would be irrecoverably lost. Pinned specimens may be sent in small boxes,—cigar boxes answer very well,—which boxes should be enclosed in a slightly larger box, and the intervening space filled with shavings, straw, or some light, soft material, to prevent sudden jars.

But now let us turn our attention from the preservation of Coleoptera to that which is more intimately connected with their collection,

THE BEST LOCALITIES

for finding them.

Almost every place where insects of any kind abound or where vegetable organisms can grow will be found to respond to the search of the careful and industrious collector with some of the many species of Coleoptera. The Mammoth Cave has two species peculiar to itself, the arid desert has its own species and the frigid zone is not deficient. In our own climate hardly a place can be found that does not harbor a few species.

In all our walks, every available stone or board that has laid close upon the ground, should be turned over and not only the ground beneath it but also the under surface of the stone itself carefully examined to find any beetles which may have taken shelter there. During April, May and June, along the embankments of our rail-roads, this will be found to reveal many and often rare species; for along these banks may be found a large number of bricks, sleepers and pieces of board which afford shelter to many insects. Here different species of *Chlaenius*, *Harpa-lus*, *Pterostichus*, *Anisodactylus* and *Dicae-lus* are especially frequent.

Alongside the rail-roads may often be found also uncommon plants, the seed of which were, perhaps, scattered from passing trains, and upon these plants may be found rare species. All rare plants should be carefully examined and the species taken upon them noted. The weeds and grass can be swept with a net and a large number of specimens collected.

Nor should ponds and brooks be neglected,

for here may be found a great variety of beautiful and interesting species. With a flat-sided net, made especially for the purpose, as before mentioned, the bottom of the brooks, rivers, and particularly of the stagnant ponds should be explored for their hidden insect treasures. If a dead rat or other small decaying animal is left in the water, the larger species of water-coleoptera will often be found feeding upon it, and can be easily taken.

In this immediate vicinity, the river-bank presents one of the most profitable walks for a collector. The water has its special inhabitants. The weeds, planted by the annual freshets, have their devourers, while along the bank, beneath the stones and refuse, and in the sand, may be found, perhaps, a larger number of species than in any other single locality. In one day's collecting, on the bank of the Connecticut, I have taken the following species of predaceous coleoptera, to say nothing of the vegetable feeders :

Cicindela macra, *rugaria*, *generosa* and *repanda* ; *Omophron americanum* ; *Elaphrus ruficornis* ; *Scarites subterraneus* ; *Brachinus fumus* ; *Galerita janus* ; *Platynus*

octopunctatus, *cupripennis* and *extensicollis*; *Schizogenius* *amphibius*; *Pterostichus* *stygius*; *Animoglossus emarginatus*; *Chlaenius* *cestivus*, *sericeus*, *tricolor* *prasinus* and *chlorophanus*; *Agonoderus* *lincoln*; *Anisodactylus* *discolor*; *Harpalus* *erraticus*; *Bembidium* *inæquale*, *nitidum*, *nigrum*, *dorsale* and *fugax*; in all twenty-eight species.

All animals found dead in the fields should be watched and the species taken which assemble to feed upon them. If possible, they should be removed to some sandy place where they will attract more specimens. Pieces of putrid meat can be used for the same purpose.

Fungus of all kinds seems to be the food of a large number of *Tenebrionidæ* and some other beetles, and when in a decayed state is usually frequented by many species of *Staphylinidæ*.

Under the bark of many kinds of trees is a good place to collect. The most species will be found there in the early part of spring when they have just left their pupal state and have come to the surface of the wood, beneath the bark, to remain until later in the season. But if a collector waits until

warm weather, he will have poor success in "bark-collecting," for the coleoptera will have left.

Ants-nests are often infested with beetles, some of which are quite rare.

Another good place for spring collecting is about maple, birch and butternut stumps where trees were cut the previous winter. A few chips may be placed upon the stumps and the beetles will congregate beneath them.

But enough general localities have been stated to give the young collector an idea of the varied localities to which it is best to turn his attention. Every collector should keep notes of the dates of appearance and disappearance, localities and food-plants of all the species he is able. For the purpose of guiding, in some degree, the search for certain of our species, I append the following list of food-plants and localities.

LIST OF HABITATS.

CICINDELIDAE. CARABIDAE.

These are all predaceous and are found in various places and at all seasons.

DYTISCIDAE. HYDROPHILIDAE. GYRINIDAE.

Feed upon carrion and insects about the water.

SILPHIDAE.

Feed upon carrion.

STAPHYLINIDAE.

These are found chiefly upon decaying animals and vegetables, and about excrement. They are supposed to devour the larvae of other insects.

HISTERIDAE. NITIDULIDAE.

Upon decaying animal and vegetable matter.

Lobiopa undulata.

Have been found under oak bark.

Amphotis ulkei. *Phenolia grossa.*

Found under butternut bark.

Ips sanguinolentus. *Omosita colon.*

Common about maple and birch sap, running from stumps.

Thymalus fulgidus.

The larvae feed upon a fungus. (*Polyporus betuli-*

nus) which is parasitic upon the trunks of white birch trees.

Catogenus rufus.

Under walnut and ash bark, early in the spring.

Cucujus clavipes.

Under butternut bark.

Brontes dubius.

Under chestnut bark.

DERMESTIDAE. BYRRHIDAE.

Among the species of these, are the notorious museum pests, which devour the specimens in our museums of natural history. They are not particular about their food and take either animal or vegetable matter.

Lucanus dama.

• Larvae live in decaying oak wood and bark, about which the beetles may be found.

Ceruchus piceus.

The larvae live in decayed chestnut and willow.

Passalus cornutus.

In several kinds of decayed wood.

CANTHON. COPRIS. PHANAEUS. ONTHOPHAGUS. APHODIUS. GEOTRUPES.

All the species of these genera feed upon excrement, and among them are the so-called tumble-bugs.

TROX.

Especially common about the hoofs and hair of decaying animals, and the refuse of tanneries.

Dichelonycha elongatula.

Upon chestnut and other leaves.

Serica trociformis.

Eats maple and oak leaves.

Macroductylus subspinosus.

On many kinds of leaves, but very common on those of the grape and rose.

Anomala lucicola. Pelidnota punctata.

Common on grape leaves.

Cotalpa lanigera.

The larvae feed upon roots; the perfect insect on willow leaves.

Coraebus cogitans.

About alder.

Brachys terminans.

On oak leaves.

Alaus oculatus and myops.

In pine stumps and wood.

Melanotus fissilis and communis.

In decaying pine and other wood.

CLERUS.

Several species are found about fresh cut pine wood during the warmest days of spring.

CORYNETES.

Often common about carrion.

TENEBRIONIDAE.

These are usually found under bark and about fungus.

Tenebrio molitor.

This is the notorious meal-beetle of Europe and is very common in most graneries.

Boletotherus cornutus.

Found upon fungus growing on decayed wood.

Hoplioecephala bicornis.

On many species of fungus.

Hypophilocus parallelus.

Under pine bark.

Ciste'a sericea.

Common upon flowers of many kinds, especially those of the meadow-sweet or tea-weed, (*Spiraea*)

Rhipiphorus pectinatus.

Upon flowers of mountain-mint, (*Pycnanthemum*)

Meloe angusticollis. **Epicauta vittata and cinerea.**

These usually feed upon the leaves of the potato.

Epicauta pensylvanica.

Upon the flowers of the golden-rod, (*Solidago*.)

Macrobasis fabricii.

Feeds upon the wild indigo, (*Baptisia tinctoria*.)

Mycterus scaber.

Common on tea-weed blossoms.

Boros unicolor.

This species is found under the bark of dead yellow pine, where the bark is exceedingly loose.

Hylurgus terebrans.

Found about pine wood in which the larvae feed.

Cossonus platalea.

Found under chestnut and butternut bark.

Conotrachelus nenuphar.

This is the notorious plum-weevil or curculio.

Cryptorhynchus foveolatus.

Found upon the evening-primrose, (*Oenothera biennis*.)

Pissodes strobi. Hylobius pales.

Common about pine.

Lixus concavus.

Feeds upon yellow-dock.

Lepyrus geminatus.

This species is found on the willow.

Arrhenodes septentrionis.

Under the bark of dead oak trees.

Rhynchites bicolor.

Infests rose-bushes, both wild and cultivated.

Attelabus rhois.

This species rolls the leaves of the hazel.

Cratoparis lunatus.

Often found upon a species of fungus growing on dead trees and stumps.

Bruchus pisi.

This is the common pea weevil.

Parandra brunnea.

Found in dead beech trees.

Orthosoma cylindricum.

The larvae live in pine wood.

Elaphidion villosum. Phymatodes variabilis.

The larvae feed upon oak wood.

Eriphus suturalis.

Found upon daisy blossoms.

Clytus robiniae.

The larvae feed upon locust wood. The beetles are often common upon yellow-weed blossoms.

Tetraopes tornator and canteriator.

Common upon milk-weed. (*Asclepius*)

Saperda candida.

The larvae bore the wood of apple-trees.

Desmocerus cyaneus.

Found upon elder blossoms.

Rhagium lineatum.

Common under pine bark in the early spring.

STRANGALIA. LEPTURA.

The species of these genera live about many different kinds of flowers.

Lema trilineata.

Very common on the potato.

Uroplata quadrata.

The larvae mine in apple leaves. The beetles can be found on the alder and the shrub-bush, (*Amelanchier canadensis*.)

Cephaloleia metallica.

Found on the potato.

Chelymorpha cribraria.

Common on the wild morning glory.

Deloyala clavata.

Feeds upon the potato.

Coptocycla sexpunctata.

Very common on the wild morning glory.

Galeruca tomentosa.

Upon the golden rod.

Galeruca sagittariae.

Common upon a water weed, the arrow-head.
(*Sagittaria.*)

Diabrotica vittata.

Very destructive to cucumber vines.

Diabrotica 12-punctata.

This species is found on the golden rod.

Disonycha alternata.

Common on the willow.

Blepharida rhois.

Feeds upon the blossoms and leaves of sumach.

Labidomera trimaculata.

Upon milk-weed, (*Asclepias.*)

Calligrapha scalaris.

Found on the elm.

Calligrapha spiracae.

Feeds upon the leaves of the hazel.

Calligrapha philadelphica.

Feeds upon the leaves of osier.

Calligrapha bigsbyana.

Upon willow leaves.

Gastrophysa caeruleipennis.

Feeds upon the leaves of knotgrass, (*Polygonum aviculare*.)

Gastrophysa vitellinae.

This species is common on the willow.

Eumolpus auratus.

Very common on the dogbane, (*Apocynum cannabinum*.)

Heteraspis pubescens.

Very common on the scabish.

Chlamys plicata.

On the sweet-fern, (*Comptonia asplenifolia*.)

COCCINELLIDAE.

All the species of these are supposed to feed upon other insects and their eggs, with the exception of *Epilachna borealis* which is said to devour the leaves of the pumpkin. The *Coccinellidae* are often called lady-bugs, or lady-birds.

Lycoperdina lineata.

These are often very common under boards and stumps, during the middle of the winter. I have never found them except in cold weather.

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